



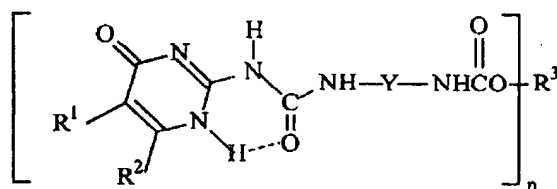
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### AMENDMENTS TO THE CLAIMS

1. (Currently amended) A two-layer imageable element comprising:
  - a substrate;
  - a top layer comprising a thermally imageable composition comprising: (a) a first thermally imageable composition comprising a first thermally sensitive supramolecular polymer which exhibits an increased solubility in an aqueous developer solution upon exposure to heat; ~~said the~~ first thermally sensitive supramolecular polymer comprising: at least one covalently bonded unit; and at least one thermally reversible non-covalently bonded unit, which includes a two or more centered H-bond within each non-covalently bonded unit or (b) a thermally imageable composition free of ~~said the~~ first thermally sensitive supramolecular polymer; and
  - disposed between ~~said the~~ substrate and ~~said the~~ top layer, a bottom layer comprising a second thermally imageable composition comprising a second thermally sensitive supramolecular polymer which exhibits an increased solubility in an aqueous developer solution upon exposure to heat; ~~said the~~ second thermally sensitive supramolecular polymer comprising: at least one covalently bonded unit; and at least one thermally reversible non-covalently bonded unit, which includes a two or more centered H-bond within each ~~said non-covalently bonded unit~~.
2. (Currently amended) The imageable element of claim 1, wherein the top layer comprises the first thermally sensitive supramolecular polymer, and wherein ~~said the~~ two or more centered H-bond in ~~said the~~ top layer is a ~~four-centered~~ four-centered H-bond.
3. (Currently amended) The imageable element of claim 2, wherein ~~said the~~ four-centered H-bond in ~~said the~~ top layer comprises two isocytosine groups.
4. (Currently amended) The imageable element of claim 1, wherein the top layer comprises the first thermally sensitive supramolecular polymer, and wherein ~~said the~~ covalently bonded unit in ~~said the~~ top layer is derived from a polyfunctional material that is soluble or dispersible in an aqueous developer solution.

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5. (Currently amended) The imageable element of claim 4, wherein ~~said the~~ polyfunctional material is selected from the group consisting of: polyfunctional phenolic resin, acrylic resin, polyester resin, polyurethane resin, and a combination thereof.
6. (Currently amended) The imageable element of claim 5, wherein ~~said the~~ polyfunctional phenolic resin is selected from the group consisting of: phenol/cresol novolak, polyvinyl phenol polymer, vinyl phenol/hydrocarbyl acrylate copolymer, pyrogallol/acetone polymer and a mixture thereof.
7. (Currently amended) The imageable element of claim 1, wherein the top layer comprises the first thermally sensitive supramolecular polymer, and wherein ~~said the~~ first thermally sensitive supramolecular polymer ~~n said the top layer comprises a supramolecular polymer derived from monomers represented by~~ including units having the formula:



wherein each  $R^1$  and  $R^2$  is independently selected from the group consisting of: hydrogen and hydrocarbyl;

wherein Y is a hydrocarbylene derived from a diisocyanate represented by the formula  $Y(NCO)_2$ ;

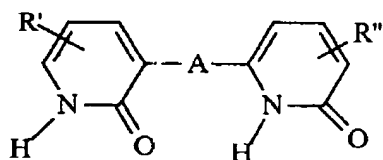
wherein  $R^3$  is a phenolic residue derived from a polyfunctional phenolic resin represented by the formula  $R^3(OH)_n$ ; and

wherein n is at least 1.

8. (Currently amended) The imageable element of claim 7, wherein ~~said the~~ polyfunctional phenolic resin is selected from the group consisting of: phenol/cresol novolak, polyvinyl phenol polymer, vinyl phenol/hydrocarbyl acrylate copolymer, pyrogallol/acetone polymer and a mixture thereof.

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9. (Currently amended) The imageable element of claim 7, wherein ~~said the~~ diisocyanate is selected from the group consisting of: isophorone diisocyanate, methylene-bis-phenyl diisocyanate, toluene diisocyanate hexamethylene diisocyanate, tetramethylxylene diisocyanate, dimers thereof, adducts thereof with diols, and mixtures thereof.
10. (Original) The imageable element of claim 7, wherein n is 1, 2 or 3.
11. (Currently amended) The imageable element of claim 1, wherein the top layer comprises the first thermally sensitive supramolecular polymer, and wherein said the thermally reversible non-covalently bonded unit in said the top layer includes a two-centered H-bond, which comprises two 2-pyridone groups.
12. (Currently amended) The imageable element of claim 11, wherein ~~said the~~ first thermally sensitive supramolecular polymer comprises a supramolecular polymer derived from monomers represented by the formula:



wherein each R' and R'' is independently selected from the group consisting of: H, linear, branched or cyclic alkyl, aryl, aralkyl, alkaryl, substituted aryl, alkenyl, halogen, cyano, nitro, alkoxy, aryloxy, alkoxy carbonyl, amido, acyl, aminocarbonyl, carboxylic, sulfonic, imide, N-acyl sulfonamide and phenolic hydroxy with the proviso that at least one of ~~said the~~ R' and R'' groups is selected from the group consisting of: carboxylic, sulfonic, imide, N-acyl sulfonamide and phenolic hydroxy; and wherein A is a bridging group ~~selected from~~ ~~alkylene, arylene, aralkylene, alkarylene, substituted arylene, -O-, -S-, NR'', -CH=CH-~~ and ~~-C=C-~~.

13. (Currently amended) The imageable element of claim 1, wherein the top layer comprises the first thermally sensitive supramolecular polymer, and wherein said the thermally reversible

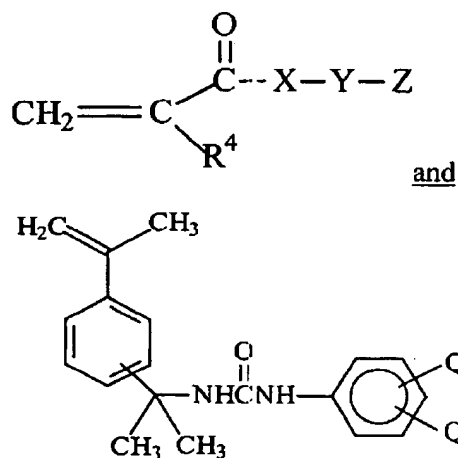
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non-covalently bonded unit in ~~said~~ the top layer includes a three-centered H-bond, which comprises a cyclic imide group and a 2,6-diaminotriazine group.

14. (Currently amended) The imageable element of claim 1, wherein the top layer comprises the first thermally sensitive supramolecular polymer, and wherein ~~said~~ the first thermally sensitive supramolecular polymer in ~~said~~ the top layer comprises a maleimide/styrene copolymer associated with a 4-vinyl-2,6-diaminotriazine/ styrene copolymer, with the proviso that ~~said~~ the copolymers comprise at least one base-soluble functional group selected from the group consisting of: carboxylic, sulfonic, imide, N-acyl sulfonamide and phenolic hydroxy.
15. (Currently amended) The imageable element of claim 2, wherein ~~said four-centered~~ the four-centered H-bond comprises two N N'-diacetyl-2,6-diaminotriazine units.
16. (Cancelled)
17. (Currently amended) The imageable element of claim 1, wherein ~~said~~ the two or more centered H-bond in ~~said~~ the bottom layer is a ~~four-centered~~ four-centered H-bond.
18. (Currently amended) The imageable element of claim 17, wherein ~~said~~ the four-centered H-bond in ~~said~~ the bottom layer comprises two isocytosine groups.
19. (Currently amended) The imageable element of claim 1, wherein ~~said~~ the covalently bonded unit in ~~said~~ the bottom layer is derived from a polymer, which is soluble or dispersible in an aqueous developer.
20. (Currently amended) The imageable element of claim 19, wherein ~~said~~ the polymer comprises at least one base soluble functional group.
21. (Currently amended) The imageable element of claim 20, wherein ~~said~~ the base soluble functional group is selected from the group consisting of: hydroxyl, carboxylic acid, sulfonic acid, phosphoric acid, imide, N-acyl sulfonamide and a combination thereof.

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22. (Currently amended) The imageable element of claim 21, wherein ~~said the~~ hydroxyl group is an aromatic hydroxyl group.
23. (Currently amended) The imageable element of claim 19, wherein ~~said the~~ polymer is formed by polymerizing a monomer mixture comprising one or more of an ethylenically unsaturated monomer having a functional group selected from the group consisting of: hydroxyl, carboxylic acid, sulfonic acid, phosphoric acid and a combination thereof.
24. (Currently amended) The imageable element of claim 23, wherein ~~said the~~ ethylenically unsaturated monomer is selected from the group consisting of compounds represented by the formula formulas:



and a mixture thereof;

wherein:

each  $\text{Q}^1$  and  $\text{Q}^2$  is independently selected from the group consisting of: hydroxyl and carboxylic acid groups;

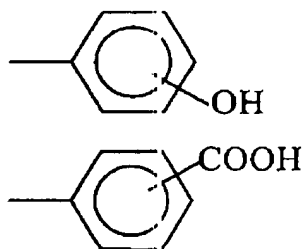
$\text{R}^4$  is selected from the group consisting of: hydrogen, linear, branched or cyclic alkyl of 1 to 22 carbon atoms, linear, branched or cyclic substituted alkyl of 1 to 22 carbon atoms, aryl of 6 to 24 carbon atoms and substituted aryl of 6 to 24 atoms, wherein ~~said the~~ substituent is selected from the group consisting of: alkyl, aryl, halogen, keto, ester, alkoxy and cyano;

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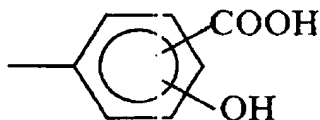
X is selected from the group consisting of: O, S and  $\text{NR}^5$  wherein  $\text{R}^5$  is selected from the group consisting of: hydrogen, linear, branched or cyclic alkyl of 1 to 22 carbon atoms, linear, branched or cyclic substituted alkyl of 1 to 22 carbon atoms, aryl of 6 to 24 carbon atoms and substituted aryl of 6 to 24 atoms, wherein the substituent is selected from the group consisting of: alkyl, aryl, halogen, keto, ester, alkoxy and cyano;

Y is selected from the group consisting of: linear, branched or cyclic alkylene of 1-22 carbon atoms, alkyleneoxyalkylene, poly(alkyleneoxy) alkylene, alkylene-NHCON( $\text{R}^5$ )- and a bond; and

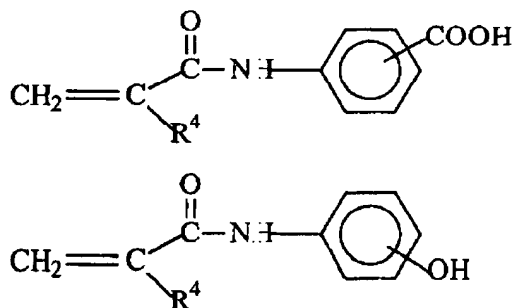
Z is selected from the group consisting of: hydrogen, hydroxyl, carboxylic acid and a ~~group~~ groups represented by the ~~formula~~ formulas:



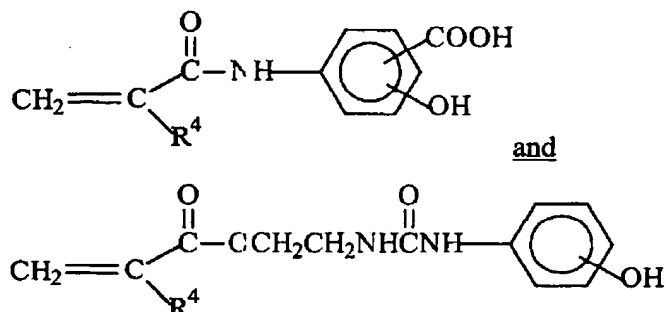
~~or~~ and



25. (Currently amended) The imageable element of claim 24, wherein ~~said the~~ ethylenically unsaturated monomer is selected from the group consisting of compounds represented by [[a]] the formula formulas:

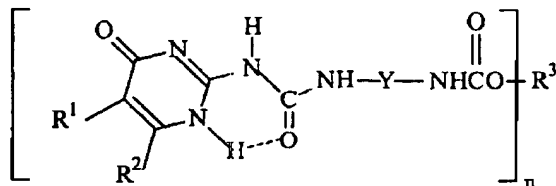


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and a combination thereof.

26. (Currently amended) The imageable element of claim 23, wherein ~~said the~~ monomer mixture further comprises an ethylenically unsaturated comonomer.
27. (Currently amended) The imageable element of claim 26, wherein ~~said the~~ ethylenically unsaturated comonomer is selected from the group consisting of: acrylic acid, methacrylic acid, acrylic acid ester, methacrylic acid ester, hydroxyethyl acrylate, hydroxyethyl methacrylate, hydroxypropyl acrylate, hydroxypropyl methacrylate, acrylamide, methacrylamide, N-methylacrylamide, N-methylmethacrylamide, acrylonitrile, methacrylonitrile, vinyl chloride, vinylidene chloride, vinyl acetate, vinyl ether, styrene, ~~N-phenylmaleimide~~ N-phenylmaleimide, and a mixture thereof.
28. (Currently amended) The imageable element of claim 1, wherein ~~said the~~ bottom layer further comprises a ~~polyfunctional phenolic resin represented by~~ supramolecular polymer including units having the formula:



wherein each  $R^1$  and  $R^2$  is independently selected from the group consisting of:  
hydrogen and hydrocarbyl;

wherein Y is a hydrocarbylene derived from a diisocyanate represented by the  
formula  $Y(NCO)_2$ ;

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wherein  $R^3$  is a phenolic residue derived from a polyfunctional phenolic resin represented by the formula  $R^3(OH)_n$ ; and  
wherein n is at least 1.

29. (Currently amended) The imageable element of claim 28, wherein ~~said the~~ polyfunctional phenolic resin is selected from the group consisting of: phenol/cresol novolak, polyvinyl phenol polymer, vinyl phenol/hydrocarbyl acrylate copolymer, pyrogallol/acetone polymer and a mixture thereof.
30. (Original) The imageable element of claim 1, further comprising a photothermal converter material.
31. (Currently amended) The imageable element of claim 1, wherein the thermally imageable composition that is free of ~~said the~~ first thermally sensitive supramolecular polymer comprises a novolak resin and an infrared dye.
32. (Currently amended) The imageable element of claim 1, wherein the top layer comprises the first thermally sensitive supramolecular polymer, and wherein said the first and said the second thermally sensitive supramolecular polymers are the same.
33. (Currently amended) The imageable element of claim 1, wherein the top layer comprises the first thermally sensitive supramolecular polymer, and wherein said the first and said the second thermally sensitive supramolecular polymers are different thermally sensitive supramolecular polymers.
34. (Currently amended) A two-layer imageable element comprising:  
a substrate;  
a top layer comprising a first thermally imageable composition comprising a first thermally sensitive supramolecular polymer which exhibits an increased solubility in an aqueous developer solution upon exposure to heat; ~~said the~~ first thermally sensitive supramolecular polymer comprising: at least one covalently bonded unit; and at least one thermally reversible non-covalently bonded unit, which includes a two or more centered H-



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bond within each ~~said~~-non-covalently bonded unit; and

disposed between ~~said-the~~ substrate and ~~said-the~~ top layer, a bottom layer comprising a second thermally imageable composition comprising a second thermally sensitive supramolecular polymer which exhibits an increased solubility in an aqueous developer solution upon exposure to heat; ~~said-the~~ second thermally sensitive supramolecular polymer comprising: at least one covalently bonded unit; and at least one thermally reversible non-covalently bonded unit, which includes a two or more centered H-bond within each ~~said~~-non-covalently bonded unit.

35. - 41. (Cancelled)

42. (Withdrawn) A method of producing an imaged element comprising the steps of:

providing a two-layer imageable element comprising a substrate; a top layer comprising a thermally imageable composition comprising: (a) a first thermally imageable composition comprising a first thermally sensitive supramolecular polymer which exhibits an increased solubility in an aqueous developer solution upon exposure to heat; ~~said-the~~ first thermally sensitive supramolecular polymer comprising: at least one covalently bonded unit; and at least one thermally reversible non-covalently bonded unit, which includes a two or more centered H-bond within each ~~said~~-non-covalently bonded unit or (b) a thermally imageable composition free of ~~said-the~~ first thermally sensitive supramolecular polymer; and disposed between ~~said-the~~ substrate and ~~said-the~~ top layer, a bottom layer comprising a second thermally imageable composition comprising a second thermally sensitive supramolecular polymer which exhibits an increased solubility in an aqueous developer solution upon exposure to heat; ~~said-the~~ second thermally sensitive supramolecular polymer comprising: at least one covalently bonded unit; and at least one thermally reversible non-covalently bonded unit, which includes a two or more centered H-bond within each ~~said~~-non-covalently bonded unit;

exposing ~~said-the~~ two-layer imageable element to thermal radiation to produce imagewise exposed regions; and

contacting ~~said-the~~ exposed two-layer imageable element and a developer within a

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- period of time after ~~said-the~~ exposing step to remove ~~said-the~~ exposed regions and thereby produce ~~said-the~~ imaged element.
43. (Withdrawn) The method of claim 42, wherein ~~said-the~~ thermally imageable element further comprises a photothermal converting material.
44. (Withdrawn) The method of claim 44, wherein ~~said-the~~ step of exposing ~~said-the~~ imageable element to thermal radiation is carried out using an infrared laser.
45. (Withdrawn) The method of claim 42, wherein ~~said-the~~ period of time is up to 1 hour.
46. (Withdrawn) The method of claim 42, wherein ~~said-the~~ thermal radiation has a pixel dwell time of not more than 100  $\mu$ s.
47. (New) The imageable element of claim 17, wherein the four-centered H-bond comprises two N, N'-diacetyl-2,6-diaminotriazine units.
48. (New) The imageable element of claim 1, wherein the thermally reversible non-covalently bonded unit in the bottom layer includes a three-centered H-bond.
49. (New) The imageable element of claim 48, wherein the three-centered H-bond comprises a cyclic imide group and a 2,6-diaminotriazine group.
50. (New) The imageable element of claim 48, wherein the second thermally sensitive supramolecular polymer in the bottom layer comprises a maleimide/styrene copolymer associated with a 4-vinyl-2,6-diaminotriazine/styrene copolymer, with the proviso that the copolymers comprise at least one base-soluble functional group selected from the group consisting of: carboxylic, sulfonic, imide, N-acyl sulfonamide and phenolic hydroxy.
51. (New) The imageable element of claim 34, wherein the two or more centered H-bond in the bottom layer is a four-centered H-bond.

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52. (New) The imageable element of claim 34, wherein the two or more centered H-bond in the bottom layer is a three-centered H-bond.
53. (New) The imageable element of claim 34, wherein the two or more centered H-bond in the top layer is a four-centered H-bond.
54. (New) The imageable element of claim 34, wherein the two or more centered H-bond in the top layer is a three-centered H-bond.